

Claims

1. A process for forming a chain extended thermoplastic polymer which comprises reacting:
 - 5 (i) a prepolymer comprising one or more guanidinium or biguanidinium units and having at least one reactive end group; and
 - (ii) a chain extender having at least two groups able to react with the reactive end group(s) in (i).
- 10 2. A process according to claim 1 which is performed at a temperature of 0 to 110°C.
3. A process according to any one of the preceding claims wherein the reactive end group is a nucleophilic group.
- 15 4. A process according to claim 3 wherein the nucleophilic group is thiol, hydroxy or an amino group.
5. A process according to any one of the preceding claims wherein the at least two groups able to react with the reactive groups in (i) are selected from isocyanate, epoxide,
20 halide and (meth)acrylate.
6. A process according to any one of the preceding claims wherein the reactive end groups are amino groups, including an amino group in salt form, and the at least two groups able to react with the reactive groups in (i) are selected from isocyanate and epoxide.
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7. A process according to any one of the preceding claims wherein the prepolymer has low levels of branching.
- 30 8. A process according to any one of the preceding claims wherein the prepolymer is in salt form.
9. A chain extended thermoplastic polymer obtained or obtainable by a process according to any one of the preceding claims.
- 35 10. A composition comprising:
 - (a) from 0.1 to 10 parts of a chain extended thermoplastic polymer according to claim 9;
 - (b) from 0 to 10 parts of binder;
 - 40 (c) from 30 to 60 parts of water-soluble organic solvent; and

(d) from 35 to 80 parts water;
wherein all parts are by weight and the total number of parts (a) + (b) + (c) + (d) = 100.

5 11. An ink-jet printing process comprising the steps (a) and (b) in any order or simultaneously:

- (a) applying an ink to a substrate by means of an ink-jet printer in a localised manner to form an image on the substrate; and
 - (b) applying to the substrate a fixing composition comprising a chain extended thermoplastic polymer according to claim 9, a liquid medium and optionally a binder.
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12. A substrate printed with an image by means of the process according to claim 11 .

13. A recording sheet comprising a substrate, a chain extended thermoplastic polymer
15 according to claim 9 and optionally a binder.

14. A set of liquids suitable for use in an ink-jet printer comprising:

- (a) a fixing composition comprising:
 - (i) 0.01 to 50 parts, more preferably 0.1 to 30 and especially from 0.1
20 to 10 parts of a chain extended thermoplastic polymer according to claim 9;
 - (ii) 50 to 99.8, more preferably 60 to 80 parts of a liquid medium selected from water, one or more water-soluble organic solvents and a mixture of water and one or more water-soluble organic
25 solvents; and
 - (iii) 0 to 50, preferably 0 to 40, more preferably from 0 to 10 parts of a binder;

wherein all parts are by weight and the total number of parts (i) + (ii) + (iii) = 100; and

- (b) an ink comprising a colorant and a liquid medium.
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15. An ink-jet printer cartridge comprising a plurality of chambers and a set of liquids, wherein the liquids are contained in individual chambers of the ink-jet printer cartridge and the set of liquids is as defined in claim 14.

35 16. An ink-jet printer cartridge comprising a plurality of chambers and a composition according to claim 10, wherein the composition is contained in the chamber of the ink-jet printer cartridge.